

AMENDMENT TO THE SPECIFICATION

Please replace the paragraph starting on page 10 with the following corrected paragraph:

In view of the foregoing, the invention is directed at a method for monitoring object motion using conventional interferometric profilometry. A typical scanning interferometer is used to illustrate the invention, but it is understood that the same principles apply to all interferometric systems, including those ~~by that~~ produce fringe shifts by means other than scanning. Accordingly, the invention consists of modifying the interferometric profiler to provide a scanning motion appropriately chosen to maintain the phase variation between frames observed during a scan within the acceptable limits of the algorithm used to calculate phase changes. This is accomplished by assuring that the cumulative effect on the OPD change with respect to the reference surface produced by the scanner motion and the sample deformation produces phase-change data at each step that fall within the operational window of the processing algorithm (nearly $\pi/2$, for example). The scanner motion can be so manipulated on the basis of prior knowledge about the nature of the object motion, or of knowledge obtained by pre-calibration, or

by real-time feedback based on current measurements. In such a case, the scanner motion may be adjusted automatically through feedback to deliver optimal measurement results as the scanner progresses in its motion. The object motion is then recovered from the scanning information by tracking the observed phase (or OPD) change from frame to frame. By comparing the phase variation measured by interferometric analysis with the phase change expected from the scanner motion, the out-of-plane object motion may be recovered in straightforward manner (that is, by the difference measured between the two at each step). If a reference signal is available, the actual phase step of the scanner measured by the reference signal is subtracted from the phase change measured by interferometric analysis, thereby improving the accuracy of the instrument.